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## Traceability around the world

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### ABSTRACT

With the business case for a national animal identification system due in July 2005, it is appropriate to take stock and to see where New Zealand (NZ) and other countries are at with animal and full supply chain traceability. The objective should be to learn and contribute to the outcome. Full supply chain traceability is on the horizon, NZ needs to be proactive and valuable lessons are available particularly from the United Kingdom (UK) and Canadian experiences. The preferred position seems to be one where government plays a leading role without burdening the industry with yet another set of legislative requirements. For this to work effectively, the industry has to commit to traceability, to go beyond ordinary compliance type applications and to use it as a differentiator in the market place. Traceability is not going to go away, and as the requirements will continue to increase around the world, the best option is to embrace it.

**Keywords:** traceability; compliance; animal identification.

### INTRODUCTION

With a succession of major food safety crises (BSE in cattle, dioxin in chicken feed, foot-and-mouth disease) in Europe, and illegal drug residues in foods imported from Southeast Asia, the European Union (EU) has embraced traceability and labelling as solutions to re-establish consumer confidence in food supply safety. Food safety scandals have toppled European governments, caused cabinet ministers to resign (e.g. Edwina Currie and the *Salmonella* saga in eggs; Channel 4, 1988) and forced a major overhaul of the European Commission (EC), the EU's executive branch. The advent of 9/11, the emphasis on food biosecurity, amendments that came into effect in 2002, and the comments of outgoing United States of America (USA) Health and Human Services Secretary, Tommy Thompson, who warned of possible attacks on the USA's food supply, raised the bar in the traceability debate even higher (Hisey, 2004).

Traceability became a transatlantic political football in late July 2001 after the EC approved proposals requiring traceability and labelling for biotech foods. The EU sees traceability and labelling as critical to ending an informal moratorium on approving new biotechnology products. It has also sparked debate in the Codex Alimentarius, the international body co-sponsored by the United Nations Food and Agriculture Organization and World Health Organization (Clapp, 2002).

Understanding the political argument is important for NZ in relation to its EU and USA trading partners – traceability could become a major trade barrier similar to the beef hormone dispute, that likewise has very little scientific support yet remains unresolved. As a major exporter to both the USA and the EU, NZ needs to take note of these opinions and developments and position itself strategically to sustain and its foreign market access and enhance it for the future.

### What is traceability?

The EC White Paper on Food Safety (2000) depicts the role envisaged for traceability in overall food administration among its member nations and this has gained significance since traceability legislation came into effect in the EU in January this year. The USA meanwhile, retains a different view on the implementation and role of food traceability, which was reiterated when the USA delegation opposed the draft definition of 'traceability/product tracing' at the Codex Committee on General Principles meeting in Paris in May 2004. The definition adopted by the 27<sup>th</sup> Session of the Codex Alimentarius Commission in July 2004 refers to "the ability to follow the movement of a food through specified stage(s) of production and processing and distribution", and avoids limiting the tracing process to 'one step forward and one step back' as advocated by the USA. The latter approach to traceability was also officiated through the USA Biosecurity Act (2002) and proposed country of origin labelling (COOL) legislation.

The USA government believes that traceback systems should be required for food safety purposes only, if at all. Private groups or industries may specify traceability for identity preservation, or for organic or kosher labelling, however, governments should not be in the business of requiring traceability for reasons other than public health and safety (Clapp, 2002).

The differences in approach and application are clear and explain the variance in opinion between the EU and the USA regarding traceability in the food chain. Other major NZ markets like Japan have yet another approach to food safety and traceability. For NZ the question is 'How will this impact on our ability to retain and trade effectively with our major markets. Do we have to do things differently?'

### Can we learn from other countries?

Trade agreements and market access compliance requirements govern the way different countries react to directives put in place by major market players.

### United Kingdom and the European Union

The European Parliament and Council adopted the Revised General Product Safety Directive (2001/95/EC), that contains traceability requirements for products, including food, in October 2001 and member states were required to implement this with effect from 15 January 2004. Traceability became part of food control legislation in the EU member nations on 1 January 2005, when Article 18 of Regulation EC 178/2002 came into force. The Food Safety Agency (2002) assessed the systems available at the time and reported as follows:

#### Assessment of current systems

- Systems for traceability in place range from paper-based to information technology- (IT) enabled. However, the increased efficiency, effectiveness and security of IT-enabled systems are recognised and they are being slowly rolled out throughout the food chain
- Systems to deliver traceability in the livestock sector, particularly beef, are relatively advanced
- The diversity of food processing operations means that the way in which traceability records are kept by businesses are usually unique and result in widely varying decisions with regard to batch size and hence the size of any recall
- Many major retailers, have already put traceability systems in place throughout their food supply chains
- In other sectors, e.g. food service, there are few initiatives to develop and implement robust traceability systems, or in some cases any batch traceability at all
- Except in a few instances (e.g. beef and some retailer chains), frameworks are not in place linking entire food chains. There is an EU project (FoodTracE), that is seeking to develop a simple framework to achieve connectivity between the steps in the food chain
- The cost of implementation of traceability systems is likely to vary enormously between business and sectors depending on the type of technology adopted

The situation remains similar 3 years later. Although businesses are required to have systems in place, most are paper-based systems and only add to the compliance burden without improving business efficiency. The new legal requirements that came into effect in January 2005 do not require internal traceability, which would allow linkages to be made between the sale of individual products and the source of materials used to produce that product. In recognition of the benefits of internal traceability, the Agency has been developing Traceability Guidelines in conjunction with key stakeholders, including major supermarket groups. These are aimed at encouraging

internal traceability, recognising that the adoption of such systems remains a business decision.

### Ireland

In 2002, the Irish Food Safety Authority set in place a system to guarantee traceability of bovine meat production through all stages from the farm to distribution. An EU Commission made recommendations to bring these practices into line with Community requirements, especially with reference to labelling, which was found to be lacking (European Commission, 2002).

Traceability solutions in the food industry have largely been paper based but many solution providers are now entering the area. Two in the Irish market are TraceAssured who market a food traceability service rather than a product and e-blana who launched Trace'05, described as an out-of-the-box solution that uses either barcode or radio frequency identification (RFID) data capture technologies to ensure compliance and product traceability along with easy integration into existing infrastructures.

### United States of America

Following the first BSE scare in the USA in December 2003, several initiatives and programmes were launched to restore confidence in the USA red meat supply. A new final rule on BSE, the Specific Risk Materials list, was extended and a 20-month age rule for beef was introduced, prompting urgent debate on how to accurately determine an animal's age, e.g. by dentition or cartilage ossification. Various States embarked upon programmes for animal identification and a number of private companies are offering traceability solutions in reaction to the Bio-security final rule and envisaged COOL requirements.

Prominent among these are Global Animal Management, (GAM), e-Merge Interactive and AgInfoLink Global Inc. part of John Deere's Food Origins, Inc. Many of these companies are taking part in the Beef Information Exchange (BIE). There is some USA producer support, especially those affiliated to the Cattleman's Beef Board and the National Cattlemen's Association, for a private sector animal ID system. In opposition to this, in April 2004 the US Department of Agriculture (USDA) announced the framework for implementing a National Animal Identification System (NAIS), to be used in all States operating under national standards. It is being developed by the USDA and State agencies – in cooperation with industry – to enable 48 hour traceback of the movement of any diseased or exposed animal. One of the major issues the USA is faced with is the fact that many farms or premises where animals are raised are not registered and a major drive is underway to correct this. In another initiative, South Dakota implemented the first State-certified beef programme, whereby consumers can trace product using an internet site and a label code, to the packing plant, through the feedlot and back to the farm of birth..

## Canada

Agriculture and Agri-Food Canada has a team dedicated to traceability who warned of traceability becoming an unfair trade barrier, and who advocate traceability as a profit centre. Both federal and provincial governments have made traceability a strategic priority and have invested close to C\$10 million to date. The Canadian Cattle Identification Agency will stop selling bar-code ear tags this summer to encourage producers to adopt RFID tags. Six varieties of tags have been approved. The agency also announced enhancements to its internet-based livestock tracking system which now allows farmers to submit calf birthdates directly.

In 2004, Canada introduced a national livestock registry. All cattle, bison and sheep included in the programme must be tagged before they can be transported. The formation of the Canadian Livestock Identification Agency, Can-Trace, helped progress this initiative and the Electronic Commerce Council of Canada was also involved. Canada sees Can-Trace as an advantage. It has already proven itself and can be enhanced to meet Japan's requirements for age verification, which is vital to regaining access to this market for Canadian beef.

The pork and poultry industry have evaluated different ID systems while goat, elk, horse, and aquaculture producers were evaluating tagging systems that would be appropriate for their species. Canada's goal is to make 80% of its food supply fully traceable by 2008.

## Australia

The National Livestock Identification System (NLIS) is a MeatSafe programme managed by Meat and Livestock Australia on behalf of industry and government and provides for whole-of-life tracking of individual cattle on a national ISO certified database using RFID devices implanted in an animal's ear or as a rumen bolus. As animals move through the livestock chain, devices are read and each owner's Property Identification Code is recorded and linked to the NLIS. Electronic ID via RFID tags became operational from 1 July 2004 in New South Wales and will be mandatory by July 2005 when all cattle moving from a property to any destination other than slaughter or live export will need an electronic NLIS ear tag or bolus. By July 2006, the only exception will be for cattle moving from the property of birth, directly to slaughter or live export and by July 2007, or earlier, all cattle will need NLIS ear tags from birth for any movement.

An electronic information system, the electronic declaration, or eDEC, has just been introduced to work alongside NLIS. The eDEC is part of MLC's on-farm food safety initiative, the Livestock Production Assurance programme, designed to help the red meat industry strengthen the food safety and animal identification system already in place. The cost of NLIS is still unresolved and figures between \$6 and \$37 per head, each year are still debated.

## Mexico

Mexico now sells two types of beef: products processed at certified Federal Type Inspection (TIF) plants and those that are not. TIF plants have the technology needed to respond promptly to foreign meat traceability requirements, whereas plants in the latter category are limited to supplying local markets. When Mexico and Japan signed a free trade agreement last March, the door was opened for increased meat sales, and volume during the second quarter of 2004 was 27 times greater than during the same period a year earlier.

Mexico is aware that the USA is taking its time in implementing nationwide traceability and is therefore accelerating an export traceability system to go hand-in-hand with TIF certification. They believe that rapid expansion of traceability will allow them to gain a competitive edge over exporters north of the border (Food Traceability Report, September 2004). In December 2004 Mexico's National Standards Association introduced the use of electronic product code technology as a tool for preventing adulteration, misrepresentation, and theft, by tracing high-value products from their source. The technology will not be used by agricultural producers for the foreseeable future due to cost. However, other systems will enable food producers to trace ingredients back to the farm level (Food Traceability Report, Dec. 2004)

## South America

Recent foot-and-mouth disease (FMD) scares have made it difficult for Mercosur exporters, Argentina, Brazil, Paraguay and Uruguay, to convince customers in premium markets that their meat is safe. Most of the FMD outbreaks were linked to a lack of livestock traceability and unregistered movement of animals across international borders. Sanitation authorities in Argentina and Brazil have done little to conceal their suspicion that Paraguay's weak traceability infrastructure poses an ongoing disease risk, (Food Traceability Report, September 2004).

## Argentina

Early in 2004, EU sanitation officials expressed doubts about the effectiveness of Argentina's traceability system in reporting the use of anabolic growth agents in livestock. Since then, Argentinian sanitation authorities have inspected processing plants and disqualified some that fell short on traceability requirements. That action sent a strong message to other suppliers to maintain reliable traceability (Food Traceability Report, May 2004). Argentina has accelerated implementation of its livestock traceability system, establishing a very aggressive March 2005 deadline for registering the entire national cattle population of 56 million. In the aftermath of FMD outbreaks in 2001, Argentinian sanitation authorities found it necessary to overcome their reputation for concealing rather than revealing the presence of the disease. Sabsay, the assistant agricultural minister, acknowledged that "The cost [of concealing outbreaks] is infinitely greater than cancellation of export sales".

In response to a FMD outbreak in swine, the agriculture ministry was forced to formulate a swine traceability system, and when FMD broke out in neighbouring nations early in 2004, ministry officials and producer groups put traceability expansion into high gear. From January 2005 Argentina's agriculture ministry will require all calves to be tagged at weaning. Livestock tags are being distributed, and bidding is underway for traceability technology to be used in meat processing plants throughout the nation, (Food Traceability Report, November 2004).

### **Brazil**

The Brazilian System of Identification and Certification of Origin for Bovine and Buffalo (Sisbov) got off to a good start two years ago, but pressure is increasing due to more demanding registration timeframes imposed by the EU. Brazil's livestock exports have tripled over the past five years, making it the world's third largest beef exporter. Sisbov's registration system came up short earlier this year when demand peaked at 100,000 animals per day. The result of this was a distortion in beef prices due to an overburdened traceability system. The House Committee for Agriculture and Rural Policy investigators found that exporters were experiencing difficulty in filling foreign orders due to a shortage of traceable cattle in the system. Consequently, the price of Sisbov cattle was distorted upward, while the price of cattle outside the system was distorted downward (Food Traceability Report, July, 2004). The pace of registration dropped off sharply when the agriculture ministry announced in December that future participation would continue to be voluntary and it is estimated that supply shortages will have emerged by the end of the first quarter of 2005. Association of Traceability and Agricultural Certification Companies (Acerta) and its members are calling on the government to quickly re-impose a mandatory time frame for nationwide Sisbov implementation (Food Traceability Report, February 2005).

### **Chile**

Chile's 'TrazaChile' traceability system was inaugurated in July 2004 by the Chile Foundation, the National Chamber of Commerce and Oracle, at an estimated cost of \$5 million, and forecasted to be in operation by the end of September 2004 (Food Traceability Report, September 2004).

TrazaChile is designed to meet EU traceability requirements scheduled to take effect on 1 January 2005, as well as requirements of the USA bioterrorism law. Organizers say the system will make it possible to trace Chilean livestock and meat products from their point of origin to consumers in foreign markets. Chilean agribusiness leaders believe that they will be able to recover their traceability investment as exporters strengthen their position in foreign markets. In addition, they believe that the system can greatly reduce losses in case of a sanitation emergency by quickly isolating problems and correcting them so that foreign customers

will not impose blanket bans on Chilean food products (Food Traceability Report, January 2005).

About 95% of the food and agriculture export companies operating in Chile now have some form of traceability system in place. Demand for traceability infrastructure is likely to remain strong as a growing number of small- to medium-size companies expand into the export market (Food Traceability Report, February 2005).

### **Japan**

From December 2004, all 30,000-plus beef outlets in Japan must comply with the national traceability system described by Ozawa *et al.* (2005).

Australian suppliers especially have been proactive in meeting marketing requirements for Japan. Webster Fresh, an Australian business with permanent representation in Japan, initiated traceability for fresh produce 10 years ago and has since refined that system to accommodate various retail quality assurance (QA) systems operating throughout the world. The system allows customers to identify production details and shipping schedules of their orders over the Internet in real time by accessing a secure website. Information is also available on what fertiliser and chemical treatments were used for individual crops. The Japanese AEON Supermarket group, for example, requires all Webster crop data and the producer is accredited to their consumer standard guarantee known as 'Green Eye'.

December 2004, saw the launch of Australia's first Japanese-owned slaughterhouse built specifically to meet Japan's new requirements for total beef traceability. Also in Australia, Nippon Meat Packers opened a plant in Oakey, Queensland to implement its Nipponham Integration Communication Open Traceability (NICOT) programme. Another Japanese operator, Itoham, owner of the Rockdale feedlot and slaughterhouse, has introduced similar systems to market its beef through the Japanese retail chain Nichiryu. This chain has created a website so that consumers can learn the complete history of imported beef.

### **New Zealand**

Thornton (2002), in an article titled 'New Zealand Livestock traceback working well after 12 months', gave the impression that NZ has full traceability of animal products. The notion was attributed to Dr Neil Clarke from Meat and Wool NZ, who has advised that he was misquoted.

When he addressed the Meat Industry Training Organisation, the Hon. Jim Sutton (2005) stated that "We do have several ad hoc animal identification and traceability systems in place, but they are often manual, or, if electronic, the information cannot be readily shared. One concern has been that, while NZ can provide adequate information on animals, the international demand for more stringent systems is growing, based on a concept of 'farm to fork'. Major trading parties, including Australia, the USA, Japan, Canada and countries in the EU have, or are in the

process of implementing animal identification systems, with the requirements for these to become mandatory across livestock sectors.”

An animal identification working group has been set up under the chairmanship of Jeff Grant, that will consult with the relevant stakeholders to develop a business case by July 2005 for the development of a national livestock identification system. The government has also recognised the importance of the wider sector and started to engage with the food and beverage sector in this regard.

One of the contributors at the GeoHealth 2004 conference referred to ‘LAPTIS’, a vision for a national Livestock and Animal Product Traceability Information System that has been established as a series of data standards and agreements between participating agencies to allow interoperability for specified existing data sources to be considered as core data registries. These will include animal identification systems approved under the Biosecurity Act 1993; interfacing with national herd and farm databases, and linked into national systems tracking product processing, storage and export. The Ministry of Agriculture and Forestry is working with the owners of the various systems and the livestock industries to achieve the necessary coordination. The future direction of overseas market access requirements is an important driver for the development of these systems (Stone, 2004).

### CONCLUSIONS

I believe it is getting late in the day, but the initiatives mentioned by the Minister are very encouraging. We have the benefit of hindsight, taking note and investigating what others have done, and what works and what does not and what would be the best for the NZ situation.

In retrospect, a pragmatic approach is to acknowledge that a multitude of levels of traceability, and methods for compliance as it relates to the food chain, exist. These can be grouped into two major categories, the first deals with identity preservation or ownership traceability, while the second deals with product attribute traceability. It seems realistic to expect the legislator to be involved in the former, but the latter, with its definite benefits to individual industries, needs to be left up to industry.

The trend is that most countries trading with the EU, especially the UK, are opting for individual animal ID, many are already compliant and others are working towards it. NZ is marginally compliant for beef, but since our major competitor in the market, Australia, is also moving to individual animal ID for sheep we will soon have little choice.

It is not a matter of whether, but of how we do it. Internationally, it seems acceptable to the different role players for governments to formulate the systems but not to be too prescriptive. The Canadian example stands out as a very supportive and friendly way of introducing traceability to a relevant industry in a scientifically sound way and with government support but without elevated compliance requirements. Clearly, traceability is seen in Canada as a differentiator and not as a compliance issue.

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